2746

Order Heteromi

Body elongate. Jaw bones complete, little aberrant. Vomer obsolete. Palatines and pterygoids well developed. Cranium with condyle confined to basioccipital. Exoccipital coalesced with epiotics and opisthotics. Opercular apparatus complete. Preopercle slightly connected with suspensorium. Suborbitals suppressed. Scapular arch formed by procapula and posttemporal, latter detached from side of cranium and impinging on supraoccipital. Hypercoracoid and hypocoracoid coalescing in single lamellar imperforate plate. Actinosts normal. Anterior vertebral

Again in many examples the white longitudinal bands on the body may be broad, in others narrow, so that the intervening blackish ones vary from 5 to 8 with the lower one or two often variously absent. Sometimes the dark basal pectoral bar is present as in Bleeker's figure of Plectorhynchus zebra, again it may be but a small blackish spot at the origin of the fin. The caudal spots in most of my examples are far more numerous than Bleeker shows.

Lesson's figure of Diagramma lessonii is crude. It shows a rather broad median dark brown band from above the maxillary expansion, axial and back to caudal basally where very narrow and ending little below center of base. A second very narrow brown line extends from

separate. Air vessel with duct. Scales small. Ventrals abdominal.

Analysis of families

a. Jaws normal; both jaws with teeth; dorsal spines separated, extend more or less length of back.

Notacanthidae.

a. Jaws form suctorial mouth; no teeth; dorsal spines graduated, close together and form high angular fin little premedian.

Liparidae.

2748

Family Notacanthidae

Body somewhat compressed, ends in tapering band like tail. Snout projecting. Mouth inferior. Both jaws with teeth, lower meets palate. Teeth close set in jaws and on palatines. Palatines movable. Sharp spine, mostly hidden by fleshy folds of lips at mouth angle. Gill openings wide, not restricted above, membranes separate, free from isthmus. Gills 4. Gill rakers long, slender. Pseudobranchiae absent. Ovaries without oviducts. Shoulder girdle loosely suspended to skull by ligament. Scales cycloid. Dorsal represented

My materials agree with Bleeker's figure of Plectorhynchus sebae, though varies in having a few more spots usually on the soft dorsal and many more spots on the caudal. Also some examples have the second dark band below the eye well on the snout above the maxillary, thus differing from Bleeker, though well shown in Garrett's figure of Diagramma lessonii as published by Günther. The bands and spots are individually quite variable, often so on the two sides of the same fish. Variation is noticeable in the narrow pale longitudinal lines on the back often quite narrow, always less in width than those on the flanks medially. Also the tail often with black spots forming transverse blackish bands sometimes to the number of 4 or 5.

by series of short separated spines, few or no soft rays. Anal rays numerous, front ones spinous.

Analysis of genera

a.' Notacanthinae. Dorsal spines 6 to 12; upper teeth compressed and obliquely triangular; ventrals confluent. Notacanthus.

a.² Polyacanthonotinae. Dorsal spines 27 to 38; teeth in jaws fine, erect; ventrals separate.

b.' Snout proboscis-like; lateral line strongly arched; dorsal and anal spines long, flexible, latter not over 30. Polyacanthonotus.

b.² Snout not very elongate; lateral line straight; dorsal and anal spines low, strong, latter 50 or more. Macdonaldia.

2750

Genus Polyacanthonotus Bleeker

Polyacanthonotus Bleeker, Verslag Kon. Modified Akad. Wetens. Amsterdam, ser. 2, vol. 8, 1874, p. 368. Type Notacanthus rissoanus Filippi and Verany, orthotypic.

Xanolacanthus Gill, Johnson's Univ. Cyclopaedia, vol. 3, 1876, p. 883. Type Notacanthus rissoanus Filippi and Verany, monotypic.

Paradoxichthys Giglioli, Nature, vol. 25, 1882, p. 535. Type Notacanthus rissoanus Filippi and Verany, monotypic.

Teratichthys (not König 1825) Giglioli, Nature, vol. 25, 1882, p. 535. Type Notacanthus rissoanus Filippi and Verany. Teratichthys Giglioli proposed to replace Paradoxichthys Giglioli.

young 3 large black blotches,
first on head, second on back
and spinous dorsal and third
on soft dorsal and back. Caudal
also largely black. Blacks
bands all more or less variably
connected by median black
longitudinal band. With age
black lateral band bifurcates
to eye and caudal peduncle,
variably and on back 2 parallel
black bands. On side below
black band variably from cheek
to pectoral base and lower
surface of caudal peduncle.
Pectoral largely blacks medially.
Black bar across caudal above
and another below. Also black
bar across anal. Length 190 mm.
(Günther.)

Mauritius, Ceylon, East Indies,
Philippines, Japan?, Polynesia.

Body very slender, elongate. Snout prolonged into proboscis like tip - at least third of head. Teeth in jaws erect, fine, in rows in each jaw, stronger on palate, arranged in form of horseshoe. Lateral line conspicuous, descending from angle of opercle in broad strong curve to below middle region of body at point not far from vent. Dorsal represented by numerous, slender, curved, flexible, disjoined spines, 29 to 37. Anal of smaller, longer,

slender, flexible spines, passing somewhat behind last of dorsal spines into low short rayed fin. Pectoral moderate, slender, above median axis close below pectoral. Ventral slender, fins entirely separate, reach vent, with 1 spine.

Analysis of species

a.' Gnathonotacanthus new subgenus. Pectoral reaches 3 1/2 to 4 times to ventral; maxillary reaches eye.

b.' Pectoral 3 1/2 to ventral. challengeri.

b.² Pectoral small, reaches 4 to ventral. vaillanti.

a.² Polyacanthonotus. Pectoral reaches 1/2 to ventral; maxillary reaches 3/4 to eye. rissoanus.

Gnathonotacanthus new subgenus

Type Polyacanthonotus vaillanti new species

Maxillary reaches eye. Pectoral reaches 3 1/2 to 4 times to ventral.

(γνάθος, jaw; Notacanthus.)

Polyacanthonotus challengeri (Vaillant)

Notacanthus challengeri Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. 388 (on Günther). — Goode and Bean, Oceanic Ichth., 1895, p. 172 (reference).

Macdonaldia challengeri Jordan and Evermann, Bull. U. S. Nat. Mus., no. 47, pt. 1, 1896, p. 617 (compiled).

Notacanthus rissoanus (not Filippi and Verany) Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 250, pl. 61, fig. B. South of Yeddo, 1875 fathoms.

2755

Depth 12 7/8, 4 1/3 to vent; head 9 to caudal base, 3 to vent, width 3 1/10. Snout 3 1/3 in head; eye 7 1/4, 2 2/5 in snout, slightly greater than interorbital; maxillary reaches nearly to eye, length 3 1/5 in head; each jaw with series of fine, minute, uniform teeth and similar row on palatines; interorbital 7 1/4, little convex. Gill rakers 6 + 16, lanceolate, rather flexible points, 1 3/5 in gill filaments, which 1 2/3 in eye.

Scales very minute, smooth,

imbricate, adherent. Lateral line distinct, axial, complete.

D. XXXIV, first spine inserted little before pectoral origin; A. I, ?, 120?; caudal small, slender, pointed, long as eye; pectoral 2 1/2 in head; ventral 2 2/5.

Uniform dull brown. Iris gray brown.

Pacific Ocean. For comparison with Günther's account and figure the following details are given:

Depth 11 4/5, 5 to vent; head 7 1/2 to caudal base, 3 1/5 to vent, width 2 2/3.

Snout 3 1/5 in head; eye 6 1/5, 1 7/8 in snout, 1 3/5? in interorbital; maxillary reaches 1/8 in eye, length from snout tip 3 in head; each jaw with series of fixed minute teeth - and similar palatine series; interorbital low.

D. XXXIV; A. I, IV, 79; caudal 3 1/4 in head, slender, pointed; pectoral 2 1/2, rays 11; ventral 2 2/3 in head, rays I, 9, fins separated.

Uniform light brown. Blackish about gills and on soft anal. Length 396 mm.

2758

Polyacanthonotus vaillanti new species

Notacanthus rissoanus (not Filippi and Verany) Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. 335 [illegible], pl. 27, fig. 1 (part).

Depth 9⅓, 3½ to vent; head 8⅓ to caudal base, 3 to vent, width 3⅙. Snout 3¼ in head; eye 5, 1½ in snout, greatly exceeds interorbital; maxillary reaches eye, length 3 in head; single row of very small uniform teeth in jaws and on palatines, series of each continuous; bony interorbital

Polyacanthonotus vaillanti new species

Depth 9 1/3, 3 1/2 to vent; head 8 1/3 to caudal base.

10½, low, depressed. Gill rakers 4+16?, lanceolate, short, ⅔ of gill filaments, which 1⅔ in eye.

Scales minute, adherent, but little imbricated. Lateral line axial, extends to last fourth of tail.

D. XXXVII, first spine inserted over middle of depressed pectoral; A. LVI, 120?; caudal 8?.?.; pectoral 2⅖; ventral 2½, separated.

Uniform brown. Iris neutral gray. Inside mouth and gill opening blackish. Fins pale brown.

2760

Diagnosis. The specimen here recorded is surely identifiable with the figure of Lotacanthus rissoanus Vaillant. The pectoral is similarly small, extending less than 1/3 to ventral, the maxillary reaches eye and the dorsal spines are in agreement. These characters seem to separate it from L. rissoanus, with which it is united by Goode and Bean.

Type No. 44248 U.S.N.M.

44248 U.S.N.M.

Albatross Station 2103.
Length 500 mm.

2761

Subgenus Polyacanthonotus Bleeker

Maxillary reaches 3/4 to eye. Pectoral reaches 3 1/2 to 4 times to ventral.

Polyacanthonotus rissoanus (Filippi and Verany)
Notacanthus rissoanus Filippi and Verany,
Mem. Accad. Sci. Torino, vol. 18, 1859, p.
190. Nice. — Günther, Cat. Fishes Brit.
Mus., vol. 3, 1861, p. 545 (copied). —
Canestrini, Fauna Italia, Pesce, 1874, p.
118 (Nice). — Giglioli, Elenco Fauna Ital.,
Pesc., 188 , p. 34; Nature, vol. 25, 1882,
p. 535. — Moreau, Hist. Nat. Poiss. France,
vol. 3, 1881, p. 162. — Vaillant, Exped. Sci.
Travailleur et Talisman, Poiss., 1888, p. (316?,
316) 335, pl. 27, fig. 1 (part; not ~~coast of Morocco, 2212 meters~~ or material). — Moreau, Manuel Ichth. France,
1892, p. 379 (Mediterranean).

2763

Polyacanthonotus rissoanus Goode and Bean, Oceanic Ichth., 1895, p. 170, (not) pl. 51, (head below) fig. 188 (copied), pl. 52, figs. 194 a (ventral) - b (copied), text fig. (compiled).

depth 12 2/5, 4 to vent; head 8 1/6 to caudal base, 2 3/5 to vent, width 3 1/8. Snout 2 7/8 in head; eye 6 1/2, 2 1/3 in snout, subequal with interorbital; maxillary reaches 3/4 to eye, with moderately small spine; teeth fine, slender, small, uniform, uniserial in jaws and palatines, continuous in both; interorbital 5 7/8, convex. Gill rakers 4 + 15.?, lanceolate, slender, subequal with gill filaments or 1/2 in eye.

2764

Scales very fine, mostly fallen. Lateral line axial, extends nearly to last third of tail.

D. XXXI, last spine double, first over hind edge of gill opening; A. XXXVI, 135?; caudal equals eye; pectoral 14/5 in head, reaches half way to ventral; ventral 2 in head, fins confluent.

Pale brown, nearly uniform. Opercles neutral gray and edge of gill opening blackish. Inside mouth and gill opening black. Iris neutral gray. Fins all pale brown.

2765

Atlantic Ocean, Mediterranean.

According to the sketch of Risso's type, published by Goode and Bean, my example is very close. The sketch shows a similar pectoral reaching half way to the ventral, though the first dorsal spine is indicated midway between the gill opening and pectoral origin and the maxillary apparently not quite reaching eye. In its fin formulae and confluent ventrals other points of agreement are noticed.

~766

43854 U.S.N.M. N. 35° 49' 30" W. 74°

34' 45". Albatross Station .

Length 328 mm.

2767

Genus Macdonaldia (Goode and Bean)

Macdonaldia Goode and Bean, Oceanic Ichth., 1895, p. 171. Type Rotacanthus rostratus Collett, designated by Jordan, Genera of Fishes, pt. 4, 1920, p. 465.

Body elongate. Snout moderate. Teeth in jaws erect, fine, also series on vomer and palate. Body and head covered with minute imbricated scales. Line of pores on inner mandibular edge. Lateral line straight, conspicuous. Dorsal of numerous, short, straight, robust, disjoined spines, 27 to 36, first before pectoral origin. Anal with longer portion of few short, slightly curved, disjoined spines, 35 to 55, passing to flexible rays below last dorsal spines. Pectoral moderate, placed far back, below middle line of body, remote from lateral line. Ventral moderate, fins entirely separate.

2.768

Analysis of species

a.' dorsal spines 28 to 33;' pectoral 2 to 2 3/5 in head.

b.' Anal spines over 50.

c.' depth 9 1/5, to vent 3 2/5;' Anal spines 52. alta.

c.² depth 13, to vent 4 2/5;' Anal spines 55. longa.

b.² Anal spines 41 to 43; depth 10 4/5 to 12 2/3, to vent 3 3/5 to 3 3/4. rostrata.

a.² dorsal spines 36; pectoral 3 2/5 in head. africana.

2769

Macdonaldia alta Gill and Townsend

Macdonaldia alta Gill and Townsend,

Proc. Biol. Soc. Washington, vol.

11, Sep. 17, 1897, p. 282.

—Jordan and Evermann, Bull. U. S.

Nat. Mus., No. 47, pt. 3, 1898, p. 2826

(copied).

Depth 9⅕, 3⅖ to vent; head 7⅞

to caudal base, 3 to vent, width 3⅕.

Snout 3⅓ in head; eye 7½, 2⅛ in

snout, greater than interorbital;

maxillary reaches eye, spine moderate,

length 3⅓ in head; teeth uniserial,

small, uniform in jaws and on palatines, series continuous; interorbital 8 3/4, convex. Gill rakers 4+13, lanceolate, rather short, subequal with gill filaments or 2 in eye.

Scales small, adherent, cycloid. Lateral line axial, extends to last third of tail.

D. XXXII, first spine inserted close behind pectoral origin; A. I,II, 125; caudal very short, 1/2 of eye; pectoral 2 1/3 in. head; ventral 2 3/4, fins separated.

Uniform dark brown. Iris neutral gray. Inside gill opening and mouth blackish brown. Fins all brown.

Bering Sea.

48774 U.S.N.M. N. 54° 54' W. 168° 59'.

In 1401 fathoms. Albatross Station 3604.

August 13, 1895. Length 465 mm.

Macdonaldia longa Gill and Townsend

Macdonaldia longa Gill and Townsend,

Proc. Biol. Soc. Washington, vol. 11,

Sep. 17, 1897, p. 282.

— Jordan and Evermann, Bull. U.S. Nat.

Mus., No. 47, pt. 3, 1898, p. 2826 (copied).

Depth 13, 4 2/5 to vent; head 8 1/5 to

caudal base, 2 1/5 to vent, width 3 1/2.

Snout 3 3/5 in head; eye 6 2/3, 1 7/8

in snout, greater than interorbital;

maxillary reaches eye, with moderate

spine, length 3 1/10 in head; teeth

fine, uniform, slender, pointed,

uniserial in jaws and on vomer; interorbital 10, low, little convex. Gill rakers 4 + 14, lanceolate, short, pointed, rather flexible, 1 3/4 in gill filaments, which 1 4/5 in eye.

Scales very small, adherent, cycloid. Lateral line axial, extends to last third in tail.

D. XXXIII, first spine over last third in space between gill opening and pectoral origin; A. IV, III; caudal 1 1/2 in eye; pectoral 2 3/5 in head; ventral 2 3/5.

2774

Uniform dark brown. Iris neutral gray. Inside mouth and gill opening blackish brown. Fins dull brown.

Bering Sea.

48775 U. S. N. M. N. 54° W. 168°

In 900 fathoms. Albatross Station 3607.

Length 535 mm.

2775

Macdonaldia rostrata (Collett)

Notacanthus rostratus Collett, Bull. Soc. Zool. France, vol. 14, 1889, p. 307. N. 46°4'40" W. 49°2'30", 1267 meters, off Newfoundland; Rés. Camp. Sci. Monaco, vol. 10, 1896, p. 48, pl. 5, fig. 21 (type).

Macdonaldia rostrata Goode and Bean, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 467, pl. 18, fig. 2 (N. 39° W. 70°, 55 to 693 fathoms); Oceanic Ichth., 1895, p. 171, pl. 51, fig. 189, (head below) pl. 52, figs. 195 a - b (N. 39°47' W. 70°30'30", 963 (ventrals) fathoms; N. 39°48' W. 70°36', 551 fathoms). —

Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 617. (compiled). —

Roule, Rés. Sci. Camp. Monaco, vol. 52, 1919,

p. 29 (N. 39° 21' 20" W. 31° 5' 45", 1360 meters).
— Barnard, Ann. South African Mus.,
vol. 21, pt. 1, June 1925, p. 172, pl. 8, fig. 5
(off Cape Point, 900 to 1000 fathoms).

Depth 10 4/5 to 12 2/3, 3 2/5 to 3 3/4 to
vent; head 8 4/5 to 9 4/5 to caudal base,
2 4/5 to 2 7/8 to anal, width 3 1/4 to 3 1/3.
Snout 2 3/4 to 2 7/8 in head; eye 5 to
6 2/3, 2 to 2 1/3 in snout, greater than
interorbital; maxillary reaches 2/3
to eye, length from snout tip 2 3/4 to
3 2/3 in head; each jaw with series of
minute teeth, similar row on palatines;
interorbital 7 1/4 to 8 1/2, convex. Gill
rakers 6 + 10?, lanceolate, rather

short and flexible, 1 3/4 in gill filaments, which 1 1/3 in eye.

Scales minute, imbricate, adherent. Lateral line continuous, until midway in tail, axial.

D. XXVIII to XXXI, first spine inserted over hind edge of gill opening; A. XLI to XLIII, 150?; caudal 5 to 1 6 in head; pectoral 2; ventral 2 1/6 to 2 1/5.

Uniform brown. Iris gray. Inside mouth and gill opening black.

Atlantic Ocean.

35601 U.S.N.M. N.39°47' W.70°30'30".

In 963 fathoms. Albatross Station

2216. Length 407 mm.

35602 U.S.N.M.

Albatross Station.

Length 430 mm.

39246 U.S.N.M. N.37° W.73°

Albatross Station.

Length 433 mm.

1 example U.S.N.M. N.39°48' W.70°36'.

In 551 fathoms. Albatross Station 2553.

Length 433 mm.

2779

Macdonaldia africana Gilchrist and Von Bonde

Macdonaldia africana Gilchrist and Von Bonde,

Fisher. Marine Biolog. Survey South Africa, Rep. No. 3, 1922 (1924), pl. 3, no. 7, pl. 3, fig. 1. Off Table Bay, 1220 fathoms. — Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 173 (type).

Depth 10, 4 to vent; head 7 to caudal base, 2 3/4 to vent, snout 3 in head; eye 7 1/2, 2 1/2 in snout; maxillary reaches 1/5 in eye, length from snout tip 2 9/10 in head; each jaw with series of minute teeth and similar ones on vomer or palatines.

Scales minute, imbricate. Line

of mucous pores on inner edge of mouth.

D. XXXVI; A. XLVII; pectoral 3 2/5 in head, rays 12; ventral 3 2/5, rays I, 9, not confluent.

Brown. Length 395 mm. (Gilchrist and Von Bonde, Barnard).

South Africa.

Genus Notacanthus Bloch

Notacanthus Bloch, Abhandl. Böhm. Gesell. Wiss., 1787 (1788), p. 278. Type Notacanthus chemnitzi Bloch, monotypic.

Acanthonotus Bloch, Naturges. Ausl. Fische, vol. 9, 1795, p. 113. Type Notacanthus nasus Bloch = Notacanthus chemnitzi Bloch. Acanthonotus Bloch proposed to replace Notacanthus Bloch; precludes Acanthonotus Gray 1831 and (Tickell) Day 1888; versus Acanthinotus Swainson in birds.

Campylodon Fabricius, Videnskb. Selsk. Skrift. Kjöbenhavn, vol. 4, 1793, p. 22. Atypic. Type Campylodon fabricii Reinhardt, Videnskb. Selsk. naturvid. og mathem. Afhandl., vol. 7,

depth 2 2/3 to 3 1/8; head 3 2/5 to 3 3/4. Snout 2 3/5 to 2 7/8 in head; eye 3 1/3 to 3 3/4, 1 1/8 to 1 1/3 in snout; maxillary reaches opposite hind nostril or to eye, length 3 1/3 to 3 1/2 in head; interorbital moderately elevated. (Scales 100 along lateral line, 8 5 along above lateral line, 13 above transversely, 25 below transversely — Day.) D. XII or XIII, 17 to 21, third spine 1 7/8 to 2 1/4 in head, first ray 2 1/2 to 2 2/3; A. III, 7, second spine 1 7/8 to 2 1/4, first ray 2 to 2 3/5; caudal 1 1/5 to 1 1/3, truncate to little convex behind; least depth of caudal peduncle 2 1/3 to 2 4/5; pectoral 1 1/3 to 1 1/2; ventral 1 1/3 to 1 2/5. White generally. In

1838, p. 120.

Campilodon Cuvier, Règne Animal, ed. 2, vol. 2, 1829, p. 205. Type Notocanthus nasus Bloch, monotypic.

Gigliolia Goode and Bean, Oceanic Ichth., 1895, p. 169. Type Gigliolia moseleyi Goode and Bean, monotypic.

Body much compressed, elongate. Head much compressed. Snout obtuse, tip rounded, not proboscis like. Mouth cleft inferior. Teeth acicular, uniserial on maxillaries, biserial on dentaries, villiform and biserial on palatines. Gills 4. Branchiostegals 8. Scales very numerous, moderate, round, thin, flexible. Dorsal almost rudimentary,

of 12 to 15 very short flexible spines, remote from each other and not connected by membrane. Anal very long, origin close behind vent, which nearly midway in body. Front part of anal of separate, flexible spines, without membranes, resembling those of dorsal; these gradually lengthen, grading into articulated branched rays. No caudal. Ventrals broad, with wide peduncle-like bases, closely contiguous, separated only by slight basal groove, situated near vent.

Analysis of species

a'. Notacanthus. Dorsal begins little before anal origin; lip normal, continuous.

b'. Pectoral reaches 4/5 to 7/8 to ventral.

c'. Dorsal spines 9; Anal 17. spinosus.

c². Dorsal spines 12 to 15; Anal 19 to 28. abbotti.

b². Pectoral reaches 2 to 2 1/4 to ventral.

d'. Dorsal spines 11; Anal 18 to 21; maxillary reaches 1/4 to 2/5 in eye. analis.

d². Dorsal spines 7; Anal 11; maxillary reaches 1/2 in eye. bonaparte.

d³. Dorsal spines 7 to 9; Anal 13 or 14; maxillary reaches 2/5 in eye. sexspinis.

b³. Pectoral reaches 3 1/4 to 3 2/3 to ventral.

e'. Dorsal spines 10; Anal 19; scales transversely 56. phasganorus.

e.[2] Dorsal spines 11; Anal 15; scales 40 transversely. chemnitzi.

a.[2] Gigliolia. Dorsal origin opposite anal origin; lips absent medially; pectoral reaches half way to anal; Dorsal spines 8 or 9; Anal 15 to 18. moseleyi.

2786

Notacanthus spinosus Garman

Notacanthus spinosus (Garman), Mem. Mus. Comp. Zool., vol. 24, 1899, p. 301, pl. I, figs. 4, a-b. N. 7°31'30" W. 79°14', 458 fathoms; N. 7°9'45" W. 80°50', 322 fathoms, Gulf of Panama.

Depth 8 1/6, 3 to vent; head 5 to caudal base, 1 7/8 to vent, width 3. Snout 4 2/5 in head; eye 6 1/8, 1 1/5 in snout, exceeds interorbital; maxillary reaches 1/5 in eye, with moderately small spine, length 3 1/3 in head; teeth fine, uniserial, uniform, slender,

12625 U.S.N.M. New Zealand.
British Museum. Length 315 mm.

pointed, in jaws and on palatines; interorbital 6 1/2, little convex. Gill rakers 3 + 9, short points, 1/2 of gill filaments, which 1 1/2 in eye. Scales minute, adherent. Lateral line axial, extends nearly to last 2/5 of tail.

D. IX, first spine inserted little behind ventral origin, last spine 5 in head; A. XVII, 108?; caudal 7 in head; pectoral 1 3/5, reaches 7/8 to ventral; ventral 2 3/5, fins confluent.

Brown. Iris gray. Opercle

2788

gray brown. Inside mouth and
gill opening blackish brown.
Fins pale brown.

Gulf of Panama.

37891 U.S.N.M.

In 458 fathoms. Albatross Station
3384. Length 167 mm.

Notacanthus abbotti new species

depth 8 2/5 to 9, 3 to 3 1/3 to vent;
head 4 4/5 to 5 4/5 to caudal base, 2
to vent, width 3 to 3 2/3. Snout to
eye 4 to 6 1/3 in head; orbit 4 2/3 to 5 1/2;
eye 6 2/5 to 6 1/2, 1 2/3 to 1 7/8 in snout,
slightly greater than interorbital in
young to 1 3/5 in interorbital with age;
maxillary reaches 1/2 in eye or to hind
eye edge with age, with small concealed
spine, length 2 1/3 to 2 2/5 in head;
teeth minute, slender, uniserial,
uniform, in jaws and on palatines;

2790

interorbital 4 2/5 to 5, broadly and slightly convex. Gill rakers 4 + 11, short points, equal gill filaments or 1/2 of eye.

Scales very small, adherent. Lateral line axial, extends 2/3 in tail.

D. XII to XV, first spine inserted little behind ventral base, last spine 5 1/5 to 6 in head; A. IX to XXVIII, 56? to 98?; caudal 2 1/2 to 4 in head; pectoral 1 4/5 to 1 7/8, fin reaching 4/5 to 7/8 to ventral; ventral 2 1/5 to 3, fins confluent.

Brown. Iris neutral gray. Inside mouth and gill opening black. Edge of gill opening narrowly blackish. Jaws dark brown. Fins brownish.

Diagnosis. Related to Notacanthus bonapartii in the large eye and having dorsal origin behind ventral origin. It has more dorsal and anal spines and longer pectorals, nearly reaching ventrals.

Type No. U. S. N. M.

Named for Dr. W. L. Abbott, who

made many important collections of natural history materials, including fishes, for the U. S. National Museum.

2368. D. 5508. Camp Overton Light, Iligan Bay, S. 6° E., 4.9 miles (N. 8° 17' 24" E. 124° 11' 42"), northern Mindanao and vicinity. In 270 fathoms. August 5, 1908. Length 200 mm.

2386. D. 5510. Camp Overton Light, S. 68° E., 9.1 miles (N. 8° 16' E. 124° 3'), northern Mindanao and vicinity. In 423 fathoms. August 7, 1909. Length 260 mm. Type.

10101. D. 5293. Escarceo Light N. 59° W., 6 miles (N. 13° 28' 15" E. 121° 4' 30"), China Sea vicinity southern Luzon. In 180 fathoms. July 23, 1908. Length 157 mm.

2793

3747. D. 5504. Macabalan Point Light (Mindanao), S. 39° E., 6 miles (N. 8° 35' 30" E. 124° 36'), northern Mindanao and vicinity. Dm 200 fathoms. August 5, 1909. Length 221 fathoms.

Hotacanthus analis Gill

Hotacanthus analis Gill, Proc. U.S. Nat. Mus., vol. 6, 1883 (1884), p. 255. N. 40°2" W. 68°50'30", 547 fathoms. — Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 248 (note). — Vaillant, Expéd. Sci. Travailleur et Talisman, Poiss., 1888, p. (318) 319 (diagnosis in key). — Goode and Bean, Oceanic Ichth., 1895, p. 165, pl. 50, fig. 184, (type), pl. 52, figs. 191 a (head below) b. (ventrals), (N. 32°39' W. 76°50' 30", 478 fathoms; N. 32°39' W. 70°1', 407 fathoms). — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 615 (compiled).

27795

depth 6 7/8 to 8 7/8, 3 to 3 1/3 to vent; head 6 1/3 to 7 2/3 to caudal base, 2 2/3 to 3 to vent, width 2 1/2 to 3. Snout 3 2/3 to 4 2/3 in head; eye 5 to 5 2/5, 1 to 1 1/2 in snout, greater than interorbital in young to subequal with age; maxillary reaches 1/4 to 2/5 in eye, length 2 2/5 to 3 1/8 in head (from snout tip); interorbital 5 to 5 7/8, broadly convex. Gill rakers 3 + 14, short, lanceolate, 1/2 of gill filaments, which 1 4/5 in eye.

Scales very minute, imbricated,

2796

adherent. Lateral line distinct, axial along side to middle of tail.

D. XI, last 4 to 5 in head; A. XVIII to XXI, 138?; caudal 4 to 7 in head; pectoral 1 7/8 to 2; ventral 2 to 2 1/6, confluent.

Uniform brown. Edges of gill opening blackish. Iris gray brown.

Atlantic Ocean.

2797

33327 U.S.N.M. N.40°2' W.68°50'.

Albatross Station.

Length 510 mm. Type.

37856 U.S.N.M. N.32°39' W.76°50'

30". In 478 fathoms. Albatross Station

2677. Length 292 to 318 mm. 2 examples.

44246 U.S.N.M. N.32°39' W.70°1'.

In 407 fathoms. Albatross Station

2676. Length 222 mm.

2798

Notacanthus bonaparte Risso

Notacanthus bonaparte Risso, Archiv Naturges., 1840, p. 376, pl. 10; Nice.

Notacanthus bonaparti Filippi and Verany, Mem. Accad. Sci. Torino, ser. 2, vol. 18, 1859, p. 180 (Nice). — Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, pp. 317, 319 (diagnosis in key), p. 387.

Notacanthus bonapartii Canestrini, Fauna Italia, Pesce, 1874, p. 118 (compiled). — Moreau, Hist. Nat. Poiss. France, vol. 3, 1881, p. 161; Manuel Ichth. France, 1892, p. 378 (Mediterranean; Nice). — Goode and Bean, Oceanic Ichth., 1895, p. 166, pl. 50, fig. 185, text fig. (compiled; note on Giglioli's materials).

2799

Notacanthus mediterraneus Filippi and Verany, Mem. Accad. Sci. Torino, ser. 2, vol. 18, 1859, p. 190. Nice. — Günther, Cat. Fishes Brit. Mus., vol. 3, 1861, p. 545 (compiled). — Canestrini, Fauna Italia, Pesce, 1874, p. 118 (Nice). — Moreau, Hist. Nat. Poiss. France, vol. 3, 1881, fig. 158. — Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, pp. 317, 319, 325, pl. 27, figs. 2, a-c (Coast of Soudan, 932 to 1232 meters; Banc d'Arguin, 1495 meters).

2800

Depth 12 to 20, 5 to anal; head 6 to 7 to caudal base, 2 3/4 to anal. Snout 4 in head; eye 5 3/4, 1 1/3 in snout; maxillary reaches 1/2 in eye, length from snout tip 2 1/4 in head; premaxillary with 24 curved teeth, each dentary with 26 or 27; interorbital low.

Scales 299 in lateral line; 19 above, 25 below.

D. VII; A. XI, 120?; pectoral 2 1/8 in head; ventral 2 1/2, rays III, 6.

Sepia brown. Edges of mouth

and gill openings, also soft anal, 2801
blackish. Length 314 mm. (Vaillant.)

Atlantic, Mediterranean.

2802

Notacanthus sexspinis Richardson

Notacanthus sexspinis Richardson, Ichth. Voy. Erebus and Terror, 1846, p. 54, pl. 32, figs. 4–11. King George's Sound, Western Australia. — Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 243, pl. 60, figs. 9–15, pl. 61, fig. A (off South Australia and New Zealand). — Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. (317) 319 (diagnosis in key). — Goode and Bean, Oceanic Ichth., 1895, p. 163 (New Zealand; Cook Strait), p. 164 (diagnosis in key). — Gilchrist and Von Bonde, Fisher. Marine Biolog. Survey South Africa, Rep. No. 3, 1922 (1924), No. 7, p. 11 (off South Africa, 200 to 470 fathoms).

2803

Notacanthus annectens Boulenger, Marine Investig. South Africa, 1904, p. 167, pl. 11. Off Cape Peninsula, Table Mt. bearing N. 79° E.

Depth 10 3/5, 4 2/5 to vent; head 7 3/5 in total, 3 to vent, width 4 1/4. Snout 3 4/5 in head; eye 5, 1 2/5 in snout, greatly exceeds interorbital; maxillary reaches 2/5 in eye, length 2 3/5 in head; teeth lanceolate, small, uniserial and continuous in jaws and on palatines; interorbital 8, rather low, convex. Gill rakers 3+12, lanceolate, slender, rather flexible, longest 1 2/3 in eye; gill filaments 3/5 gill rakers.

Scales small, adherent, cycloid. Lateral line continuous to middle of tail, axial.

D. VIII, last spine 4 in head, first spine inserted midway between ventral and anal origins; A. XIV, 123?; caudal 4 1/4 in head; pectoral 1 3/4; ventral 2.

Uniform pale brown. Iris pale. Inside mouth and gill opening blackish. Fins very pale to whitish.

Off Western Australia, New Zealand and South Africa. The following is

2805

condensed from Günther:

Depth 9 1/2, 3 3/4 to vent; head 7 1/3 to caudal base, width 2 1/8. Snout 3 3/4 in head; eye 5 1/8, 1 1/3 in snout; maxillary reaches 1/2 in eye, length from snout tip 2 1/3 in head; teeth uniserial, 28 on each premaxillary, 25 on each dentary, palatine series 34; interorbital moderately high. Gill rakers 18, moderately long, soft.

Scales very thin, small, cycloid, suboval. Lateral line axial, disappears about middle of tail.

D. VII to IX; A. XIII to XV, 160; caudal 6 in head; pectoral 1 9/10, rays 12; ventral 2 3/4 in head, rays 7 or 8.

Brown, inside cavities black.

Length 460 to 508 mm.

12625 U.S.N.M. New Zealand.

British Museum. Length 315 mm.

Rotacanthus phasganorus Goode

Rotacanthus phasganodus Goode, Proc. U.S. Nat. Mus., vol. 3, April 18, 1881, p. 535. From stomach of Lamniosus brevipinnis on Grand Bank of Newfoundland. — Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 249 (compiled). — Jordan and Gilbert, Bull. U. S. Nat. Mus., No. 16, 1882, p. 900 (copied). — Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p. (318) 319 (diagnosis in key). — Goode and Bean, Oceanic Ichth., 1895, p. 167, pl. 50, fig. 186 (type). — Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 616 (compiled).

Depth 9, 4 to anal; head 7 2/5 in total, 3 1/5 to anal, width 2 3/4. Snout 4 1/8 in head; eye 6 1/8, 1 1/3 in snout, 1 2/5? in interorbital; maxillary reaches 3/4 in eye, length from snout tip 2 2/5 in head; upper teeth blunt, slender, well spaced, uniform, 3 2 each side and lower teeth shorter, more slender and in double rows; 2 to 4 irregular series of slender short teeth on palatines; interorbital 5 in head, broadly convex, low. Gill rakers 3 + 9,

lanceolate, tapering from rather robust bases to short slender points, 1 3/4 in gill filaments, which little less than eye.

Scales 400? in lateral line; 20 above, 36 below, 40 postocular. Ventrals scaly. Lateral line axial, continued to last third of tail.

D. X, first spine inserted behind ventral origin; A. XIX, 130; pectoral 2 3/5 in head, rays 17; ventral 4 1/10, rays II, 8 or 9.

Light brown, nearly cinnamon

2610

or russet. Lower surface of head little darker. Inside gill opening blackish brown. Fins all brown.

Atlantic Ocean. Known by its deep robust body and very small scales.

25972 U.S.N.M.

From stomach of Lomniosus brevipinnis.

Schooner "Gatherer". Capt. Briggs Gilpatrick. Length 910 mm. Type.

Notacanthus chemnitzii Bloch -all

Notacanthus chemnitzii Bloch, Abhandl. Böhm. Gesell. Wiss., 1787 (1788), p. 278.

.—Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 614 (compiled).

Notacanthus chemnitzi Jordan and Gilbert, Bull. U. S. Nat. Mus., No. 16, 1882, p. 370 (compiled).

Notocanthus nasus Bloch, Naturg. Ausland. Fische, vol. 9, 1795, p. 113. "East Indies."—Shaw and Nodder, Natural. Miscellany, vol. 12, 1801, pl. 466 (Indian Seas?).

— Swainson, Nat. Hist. Animals, vol. 2, 1839, p. 241 (reference).

2812

Acanthurus nasus Bloch, Naturg. Ausland. Fische, vol. 9, 1795, pl. 431. — Lacépède, Hist. Nat. Poiss., vol. 5, 1803, pp. 290, 291 (copied). — Cuvier, Hist. Nat. Poiss., vol. 8, 1831, p. 467, pl. 241 (compiled). — Valenciennes, Règne Animal, Cuvier, Ed. Ill., 1839, pl. 55, fig. 2. — Gaimard, Voy. Island Grönl., Zool., Poiss., 18 , pl. 11 (Iceland). — Günther, Cat. Fishes Brit. Mus., vol. 3, 1861, p. 544 (note). — Lütken, Vidensk. Medd. naturh. Foren. Kobenhavn, 1878, p. 145 (South Greenland). — Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 248 (compiled). — Vaillant, Exped. Sci. Travailleur et Talisman, Poiss., 1888, p.

(317) 319 (diagnosis in key). — Goode and Bean, Oceanic Ichth., 1895, p. 164, pl. 50, fig. 183 (copied) (types).

Acanthonotus masus Schneider, Syst. Ichth. Bloch, 1801, p. 390, pl. 77 ("mari Islandico").

Campylodon fabricii Reinhardt, Vidensk. Selsk. naturvid. og mathem. Afhandl., vol. 7, 1838, p. 120. Greenland.

Depth 9 2/5, 4 1/2 to vent; head 7 4/5 to caudal base, 3 1/2 to vent. Snout 2 1/2 in head; eye 8 1/4, 3 in snout; maxillary reaches 1/4 in eye, length from snout tip 2 1/5 in head, expansion equals eye, length 2 1/8 in head; premaxillary teeth 35 on

each side. 214

Scales 40 transversely between lateral line and ventral outline.

D. XI; A. XV, 118; caudal 4 1/4 in head; pectoral 2 1/8; rays 19; ventral 2 1/3 in head. Length 85 mm.

(Goode and Bean.)

Atlantic Ocean.

2615

Notacanthus moseleyi (Goode and Bean) Gigliolia moseleyi Goode and Bean, Oceanic Ichth., 1895, p. 169, pl. 51, fig. 187, pl. 52, fig. 193 (based on Günther).

Notacanthus moseleyi Barnard, Ann. South African Mus., vol. 21, pt. 1, June 1925, p. 171 (off Cape Point, 500 fathoms).

Notacanthus bonapartii (not Risso) Günther, Rep. Voy. Challenger, vol. 22, 1887, p. 249, pl. 61, fig. C. South west coast of South America, 400 fathoms.

Depth 9, 3 1/2 to vent; head 6 in total, 2 1/3 to vent, width 2 1/2. Snout 4 in head; eye 4 7/8, 1 1/4 in snout, less than interorbital; maxillary

reaches 1/2 in eye, expansion 2 2/3 in eye, length 2 1/2 in head; 20 teeth on each side of upper jaw.

Scales minute, smooth, imbricate and adherent.

D. VIII or IX; A. XV to XVIII, 150; pectoral 2 1/4 in head, rays 9; ventral 2 7/8 in head, rays I, 7, confluent.

Color uniform. Length 290 mm.

(Günther.

South Atlantic and south eastern Pacific Oceans.

Family Liparidae

Body elongate, compressed, tail long and tapering. Head small, compressed. Muzzle obtuse. Eye small. Mouth rounded, inferior, suctorial. Lower jaw imperfect, rami separated medially, connected with corresponding rides of upper jaw, invested with thick, transversely plicated, horseshoe shaped lip, reflected upwards behind on cheeks. No teeth. Scales minute. Lateral line axial, complete. Dorsal premedian, with 4 or 5 partially connected graduated spines in front and few branched rays forming elevated triangular fin. Anal long series of low

Scales 39 to 41 in median lateral series to caudal base and 8 or 9 more on latter; upper section of lateral line with 37 or 38 tubular scales, lower section with 7 to 11 to caudal base and 1 or 2 more on latter; 2 or 3 scales above lateral line, 12 or 13 below, 13 to 20 predorsal forward opposite eye center or front eye edge, 6 to 8 rows on cheek. Scales with 11 or 12 basal radiating striae; apical denticles 40 to 42; circuli very fine.

D. III, 25, I, third spine 4 to 4 1/4 in total head length, twenty first ray 1 4/5; A. II or III, 13, I or 14, I, second spine 3 7/8 to 5 1/3, thirteenth ray 2 1/5; caudal 1 1/8 to 1 1/5, well emarginate, each lobe as well developed point above and below; least depth of caudal peduncle 1 4/5 to 2 1/8; pectoral 1 1/2 to 1 3/5; ventral 1 1/8 to 1 1/2.

spines beginning under dorsal and passing into similar short rays posteriorly. Pectoral low. Ventrals inserted before dorsal, similar.

One genus.

2819

Genus Lipogenys Goode and Bean

Lipogenys Goode and Bean, Proc. U. S. Nat. Mus., vol. 17, 1894 (1895), p. 469.

Type Lipogenys gillii Goode and Bean, monotypic.

Body slender. Snout obtuse, compressed. Eye advanced. Mouth circular anteriorly, with thick, contractile lip, cleft posteriorly, flanked by fleshy flaps. Concealed spine at end of maxillary. Front nostril in short tube, hind one long and below short flap. Scales very numerous. Dorsal lower than body depth. Caudal distinct, very

small, confluent with long anal.
Pectoral rounded, short.
Ventral with 3 spines and 7 rays.

2621

Lipogenys gillii Goode and Bean

Lipogenys gillii Goode and Bean, Proc. U. S. Nat. Mus., vol. 17, 1894 (1895), p. 469, pl. 18, fig. 3. N. 37° 46' 30" W. 73° 56' 30", in 865 fathoms; Oceanic Ichth., 1895, p. 173, pl. 51, fig. 190, pl. 52, fig. 196 A-B (type).— Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, pt. 1, 1896, p. 619 (compiled).

Depth 9 3/4, 3 3/4 to anal; head 8 to anal, 3 1/6 to anal. Snout to eye 3 1/2 in head; orbit 5 1/6; eye 6 1/2, 1 7/8 in snout, 1 3/5 in interorbital; maxillary reaches 1/2 in eye, length 2 1/3 in head; as viewed below upper lip horse shoe shaped, with ~~broad~~

deep narrow grooves; interorbital 5 1/6, convex. Apparently no gill rakers; gill filaments equal orbit.

Scales very small, adherent. Lateral line axial, continuous to middle of tail.

D. V, 5, second branched ray 2 1/8 in head; A. XLI, 88, of rays anterior 10 stiff though articulated and branched, longest ray 3 2/5 in head; caudal 4; pectoral 1 2/3; ventral 1 4/5, rays III, 7, fins not confluent.

Uniform light brown. Iris dark

neutral gray. Inside mouth and gill openings blackish. Under side of gill covers darks, showing dark at edges of grayish opercles. Fins brownish.

Atlantic Ocean.

39212 U.S.N.M. N. 37° 46' 30" W. 73° 56' 30".

In 865 fathoms. Albatross Station 2742.

Length 446 mm. Type.